In the Written Opinion, the Examiner rejected the claims of the application as being obvious over EP 529,885 or Douglas (736) in view of Bier (425), Vestal (533) and Michael "An ion trap storage/Time-Of-Flight mass spectrometer". Reconsideration of this rejection is respectfully requested.

The primary references cited in the Written Opinion, the Douglas EP 529,885 and Douglas (736) references, are not material to the present claims. The claims recite an analytical apparatus which is a Time-Of-Flight (TOF) mass analyzer system. Although the Examiner indicated in the Office Action that these two primary references disclose TOF analyzer systems, reconsideration of this opinion is respectfully requested. Neither of these primary references teaches or suggests TOF mass analysis. Accordingly, the claims, which explicitly are directed to TOF, cannot be obvious over these references.

In contrast to the claimed inventions, the mass analyzer described in the Douglas (736) patent is a standard straight quadrupole ion guide. See, element 32 in Figure 1. Similarly, the mass analyzer described in the Douglas EP 529,885 reference is a three dimensional quadrupole ion trap. See, element 60 in Figure 1. Both of the Douglas references do not teach or suggest Time-Of-Flight analysis.

Likewise, the Bier (425) and Vestal (533) references, which were also relied on by the Examiner, also do not teach or suggest TOF mass analysis. Bier discloses a straight and curved shaped quadrupole ion guide mass analyzer. See, element 201 in Figure 2A. Bier also discloses configurations of three dimensional ion trap mass analyzers. See, Figures 4 and 5. Vestal (533) discloses straight quadrupole ion guide mass analyzers. See, element 20 in Figure 1, and elements 118 and 124 in Figure 5. None of these references teach or suggest a

Time-Of-Flight mass analyzer system.

Of all the references cited, only the Michael article discloses a TOF mass analyzer. Michael, however, is directed to a TOF system which is configured with a three dimensional ion trap. See, Figure 1. This ion trap is used to pulse ions directly into a Time-Of-Flight tube. It does not teach or suggest a TOF system in which ions are directed into a multipole ion guide. In contrast, all of the claims in the present Amendment are directed to a TOF system configured and operated with a multipole ion guide. Accordingly, none of the claims can be obvious over the Michael reference. In addition, Michael does not teach or suggest directing ions into a multipole ion guide which can be operated in non-trapping mode or as a two dimensional ion trap. Neither does Michael teach or suggest conducting ion mass to charge selection or ion fragmentation in a multipole ion guide with TOF mass analysis.

Accordingly, none of the references cited by the Examiner, whether considered individually or in combination, teach or suggest the TOF and multipole ion guide system claimed herein.

Moreover, the system disclosed herein is a very significant and patentable advance over the prior art. Many important performance and operational differences exist between a three dimensional ion trap and a multipole ion guide. The claimed multipole ion guide, whether operated in non trapping or in two dimensional trapping mode with TOF mass analysis, is configured and operated to eliminate many of the problems encountered with the three dimensional ion traps configured with TOF mass analysis as described in the prior art, and provides significant performance improvements over the prior art TOF mass analyzers configured with three dimensional ion traps.

In addition, the multipole ion guide-TOF system with MS/MS^n analytical capability claimed is one with specific performance capability. The multipole ion guide-TOF systems of the present invention are configured for mass-to-charge selection and/or fragmentation of ions which are located within the multipole ion guide, with or without two dimensional trapping, followed by TOF mass analysis. None of the cited references, either individually or in combination, teach or suggest such a multipole ion guide-TOF analytical apparatus.

Likewise, the method claims are also all patentable over the cited prior art. All of the method claims are directed to processes for conducting ion mass-to-charge selection and/or ion fragmentation using multipole ion guides operated in trapping or non trapping mode, combined with TOF mass-to-charge analysis of the product ions. There is no teaching or suggestion of any of the claimed methods in the cited references.

Accordingly, in view of the above, it is submitted that all of the claims are fully patentable over the prior art. Should the Examiner disagree or require further clarification of the art or any of the matters herein, Applicant requests a conference with the Examiner to discuss these matters further. A favorable Office Action allowing all of the claims is respectfully requested.

Dated: October 21, 1998

Respectfully submitted,

Morris E. Cohen (Reg. No. 39,947)
Levisohn, Lerner, Berger and Langsam
757 Third Avenue, Suite 2400
New York, New York 10017
(212) 486-7272 (phone)
(212) 486-0323 (fax)

MEC:C:\WPDOCS\ANALYT\052\OAREP1~2.WPD